

**Revision of the South Asian Bagrid Catfish Genus *Sperata*,
with the Description of a New Species from Myanmar**

by

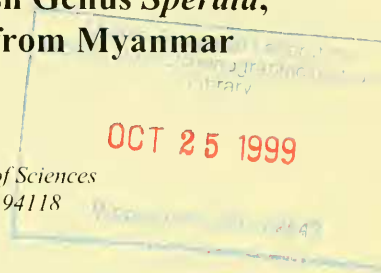
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The South Asian bagrid catfish genus *Sperata* Holly, 1939, comprises a group of four species distributed from Pakistan to Myanmar. All species of this genus are commercially important food fishes and among the largest catfishes of South Asia. The generic name for this group has undergone a series of replacements and corrections since the name *Macrones* Duméril, 1856, was proposed for *Bagrus lamarrii* Valenciennes, 1840 [= *Sperata seenghala* (Sykes, 1839)] and several other species. Most recently, the genus was known as *Aorichthys* Wu, 1939, a name published several months after *Sperata*. *Sperata aor* (Hamilton, 1822) and *S. seenghala* (Sykes, 1839) were found to be widely distributed in India and neighboring countries. *Sperata aorella* (Blyth, 1858), which has been included in the synonymy of one or the other of these species since shortly after the name was first proposed, was instead found to represent a valid species of the Ganges River delta and nearby areas. The species of *Sperata* distributed widely in Myanmar is not any of the named forms and is herein described as *Sperata acicularis* n. sp.

In 1822, Hamilton published a description and two figures of a new species of catfish from the Ganges River that he named *Pimelodus aor*. Among the characteristics mentioned in the description and seen in the illustrations were a prominent black spot on the posterior end of the adipose fin (Fig. 1a), a strongly depressed head, and an ovoid bone on the nape situated on the dorsal midline, between the tip of the supraoccipital process and the base of the dorsal fin (Fig. 1b).

Soon thereafter, several new species of fish were described as being similar to Hamilton's *Pimelodus aor*. Sykes (1839a, 1839b, 1841) stated that he considered his new species, *Platystoma seenghala*, from the Deccan region of peninsular India "closely allied" (Sykes 1841:372) to Hamilton's species. Valenciennes (in Cuvier and Valenciennes 1840) described his new *Bagrus lamarrii* as similar in form to, and of the same coloration as, *Pimelodus aor*. The similarity to Hamilton's species was clearly implied by the choice of names given to *Bagrus aorinus* Valenciennes, 1840 (in Jacquemont 1835–1844), *Bagrus aorides* Jerdon, 1849, and *Bagrus aorellus* Blyth, 1858.

At about the same time as these last species were being named, Duméril (1856) suggested that a group of catfishes, including Valenciennes' *Bagrus lamarrii*, belonged to a distinct genus for which he proposed the name *Macrones*. That name was quickly adopted for a large and diverse group of Asian bagrid catfishes (e.g., Günther 1864; Day 1877). Within the broad genus *Macrones*, Günther (1864) recognized a small subgroup based on a comparatively short adipose fin and a separate

interneural shield, to which he assigned *Pimelodus aor*, its purported synonyms, and *Bagrus lamarrii*. Although not formally named, this appears to be the first recognition of a group that is called *Sperata* herein. This group has, over time, been elevated to subgeneric rank [as *Mystus (Osteobagrus)*, Jayaram 1954] or generic rank (e.g., *Aorichthys*, Jayaram 1968; Talwar and Jhingran 1991). As part of a broad phylogenetic study of the catfish family Bagridae, Mo (1991) presented additional morphological evidence that supported the idea that these fishes formed a natural group deserving of generic rank.

The purpose of this paper is to review the species of the group referred to in the recent literature as *Aorichthys* or *Osteobagrus* in order to determine the number of, and correct names for, included species and determine the valid generic name for the group.

METHODS AND MATERIALS

Specimen lengths are given as standard length. Measurements were taken from the left side of the body as follows: anal-fin base—from anal-fin origin to posterior base of last anal-fin ray; body depth at pectoral fin—measured perpendicular to long axis of body at pectoral-fin base; body width at cleithrum—measured at anterior margin of pectoral-spine base; head length—from snout tip to most posterior edge of fleshy operculum; interneural shield length—superficial, exposed part of supraneural measured along dorsal midline; interorbital width—dorsal edge of membranous orbit of one eye to that of other eye; orbit length—horizontal distance across eye to margins of free orbital membrane; pectoral-spine length—measured from joint to tip of spinous portion, not including filamentous extension; pelvic-fin length—from pelvic-fin origin to tip of longest ray of adpressed fin; preadipose length—from snout tip to point where adipose fin starts to rise from body; preanal length—distance from snout tip to anal-fin origin; predorsal length—from snout margin to base of first dorsal-fin spine (= spinelet); prepelvic length—snout tip to base of first pelvic-fin ray; snout length—from tip of snout to horizontal line through anterior margin of fleshy orbit; snout to supraoccipital spine—from snout tip to posterior-most edge of supraoccipital spine visible on surface of skin; supraoccipital spine length—from anterior-most portion of spinous process to end of visible portion of spine.

Dorsal and pectoral-fin ray counts do not include spinous elements. Anal-fin ray counts are reported as unbranched and branched rays. Anterior unbranched rays are embedded in thick skin and difficult to count, except by radiograph. Usually, the first branched anal-fin ray occurs immediately posterior to the longest ray of the fin, which is unbranched. However, in some individuals the longest ray was branched near its tip and was therefore included in the branched ray count. Principal caudal-fin ray counts include branched rays and one unbranched ray in each lobe of the fin. Gill raker counts include all bony elements on the outer face of the first gill arch, including anterior rudiments. Total gill rakers as well as differential raker counts (upper and lower) are provided as both meristics proved useful in discriminating species. A gill raker situated at the angle of the arch was included in the count of the lower arm.

Vertebral counts were taken from radiographs or dry skeletal preparations. Counts include four vertebrae for the Weberian complex and one for the hypural complex. Vertebra 5 was recognized by having an elongate hour-glass shaped centrum, which was sutured anteriorly to the Weberian complex, and no rib. The precaudal vertebral count includes all vertebrae anterior to the centrum with a complete hemal arch; the caudal vertebral count includes all remaining vertebrae. The preanal vertebral count includes all vertebrae for which the hemal spine was anterior to first anal-fin pterygiophore. Rib counts refer to the number of vertebrae possessing a rib, even if ribs are not bilaterally paired.

Throughout the paper, we refer to the third edition of *International Code of Zoological Nomenclature* (International Commission on Zoological Nomenclature 1985) as the Code.

Museum abbreviations used in this paper follow Leviton et al. (1985).

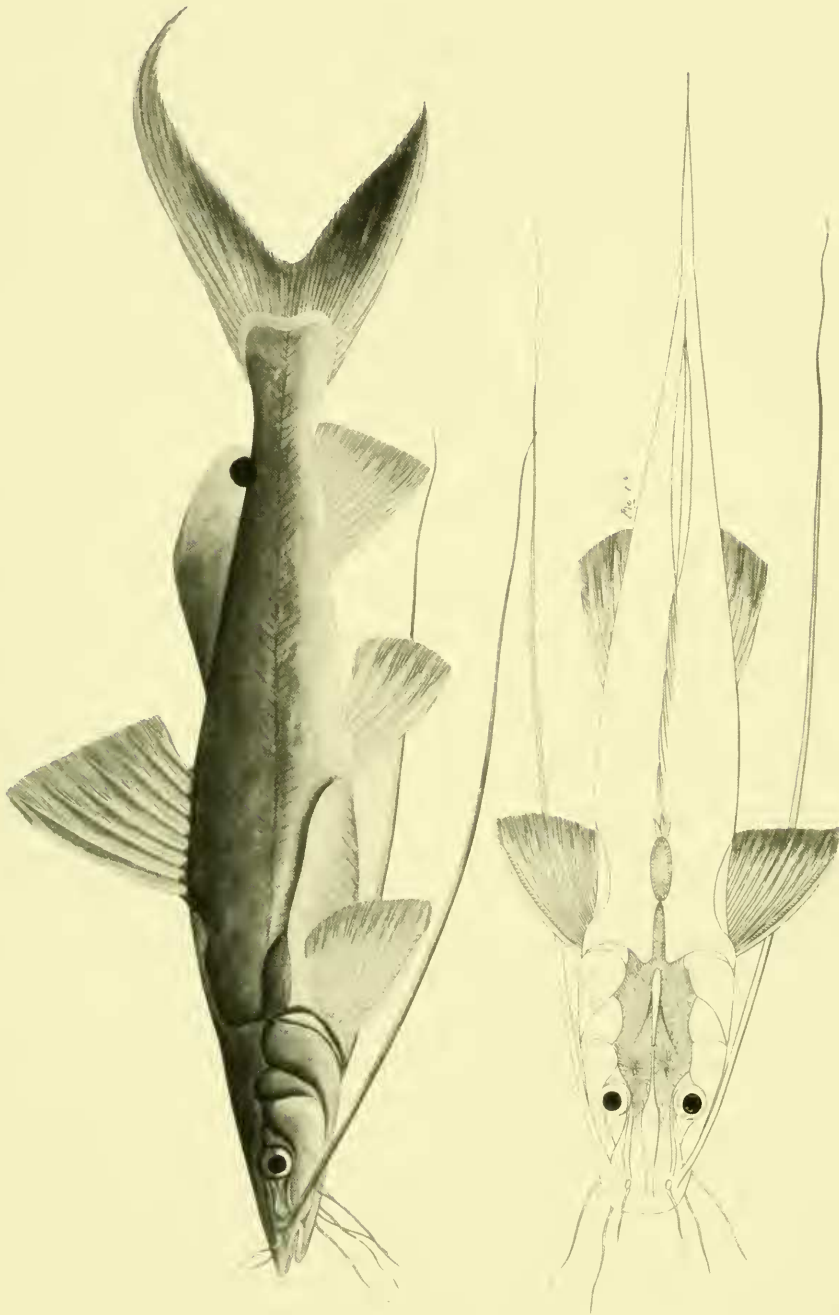


FIGURE 1. *Sperata aor*, illustration from Hamilton (1822, pl. 20, fig. 68).

SYSTEMATIC ACCOUNTS

Sperata Holly, 1939

- Macrones* Duméril, 1856:484 (Type species: *Bagrus lamarrii* Valenciennes, 1840, by original designation). Preoccupied in Coleoptera by *Macrones* Newman, 1841.
- Aoria* Jordan, 1919:341 (replacement for *Macrones* Duméril, 1856, and therefore taking the same type species, *Bagrus lamarrii* Valenciennes, 1840). Preoccupied in Coleoptera by *Aoria* Baly, 1863.
- Sperata* Holly, 1939:143 (replacement for *Macrones* Duméril, 1856, and therefore taking the same type species, *Bagrus lamarrii* Valenciennes, 1840 [but mistakenly listed with "*Sperata vittatus* (Bloch)" as type species]).
- Aorichthys* Wu, 1939:131 (replacement for *Aoria* Jordan, 1919, and therefore taking the same type species, *Bagrus lamarrii* Valenciennes, 1840).
- Macronichthys* White and Moy-Thomas, 1940:505 (replacement for *Aoria* Jordan, 1919, and therefore taking the same type species, *Bagrus lamarrii* Valenciennes, 1840).
- Osteobagrus* (subgenus of *Mystus*) Jayaram, 1954:529, 547 (Type species: *Pimelodus aor* Hamilton, 1822, by original designation).

DIAGNOSIS. — *Sperata* is distinguished from all other bagrid catfishes in having the following combination of derived characters: an elongate depressed snout, an interneural shield that is not suturally attached to the exposed surface of the first dorsal-fin pterygiophore, a concavity on the posterior surface of the posttemporal into which an anterior extension of the swimbladder rests (Jayaram 1973), a swimbladder with a complete internal longitudinal septum (Jayaram 1954), an elongate maxilla (Mo 1991), and a large round or ovoid dark spot near the posterior margin of the adipose fin.

REMARKS. — *Sperata* is a readily recognizable group of South Asian catfishes. The elongate, depressed head and snout that gives the appearance of a duck's bill and the prominent dark adipose-fin spot permit ready identification of these fishes. In addition, two species, *Sperata aor* (Fig. 2b) and *S. seenghala* (Fig. 2d), have a large, rugose shield-shaped supraneural bone on the nape (called the interneural shield by Jayaram [1954]), that is not sutured to the first dorsal-fin pterygiophore. The supraneural bone in other bagrids is firmly united along its posterior margin to the first dorsal-fin pterygiophore. The supraneurals of the other two species, *Sperata acicularis* (Fig. 2a) and *S. aorella* (Fig. 2c), are not much expanded anteriorly or laterally, but are separate from the pterygiophore. These latter two species have proportionally much longer supraoccipital spines than do the former species. Together, the supraoccipital spine and superficial part of the supraneural traverse nearly the entire middorsal extent of the nape in all four species.

As indicated in the synonymy of *Sperata*, the generic name for this group has undergone a number of changes. Almost immediately after *Macrones* was proposed by Duméril (1856), it was adopted for a large group of Asian bagrid catfishes, with *Bagrus lamarrii* as its type. *Macrones* was used widely until Jordan (1919) noted that the name was preoccupied by *Macrones* Newman, 1841 (in Coleoptera). Unfortunately the replacement he proposed, *Aoria*, was itself preoccupied by *Aoria* Baly, 1863 (in Coleoptera). The prior use of *Aoria* was noted independently in Wu (1939) and White and Moy-Thomas (1940), probably due to the recent publication of the first volume of Neave's (1939) *Nomenclator Zoologicus*, and a replacement name was proposed in each: *Aorichthys* Wu, 1939, and *Macronichthys* White and Moy-Thomas, 1940. At about the same time, Holly (1939) also discovered that *Macrones* was preoccupied, but he was apparently unaware of Jordan's replacement name when he proposed *Sperata* as a replacement. Jayaram (1954) knew of all of the generic names proposed previously for this group and correctly noted that *Macrones* and *Aoria* were preoccupied. He was apparently unaware, however, that *Sperata*, *Aorichthys*, and *Macronichthys* were each proposed as replacements, each with *Bagrus lamarrii* as its type. Instead, he considered the taxon that included the names *Pimelodus aor* and *Bagrus lamarrii* to be without an available generic-level name and

proposed the subgenus *Osteobagrus*, with *P. aor* as its type. He again supported this distinction in reviewing the taxonomic status of the generic name *Mystus* (Jayaram 1962), into which he synonymized *Macrones*, *Aoria*, *Sperata*, *Aorichthys*, and *Macronichthys*, but not *Osteobagrus*. Subsequently, Jayaram (1968, 1973) recognized *Aorichthys* as the valid name for the taxon he previously called *Osteobagrus*, which he then considered to be of generic rank. Since then, *Aorichthys* has been widely regarded as the valid name for the taxon, as either a subgenus of *Mystus* (e.g., Misra 1976) or a genus (e.g., Jayaram 1981; Talwar and Jhingran 1991).

Although both *Sperata* and *Aorichthys* were proposed in 1939, the former predates the latter by several months. *Sperata* was published in part 5/6 of volume 125 of the *Zoologischer Anzeiger*, the cover page of which bears a publication date of February 15, 1939. *Aorichthys* was published in volume 10 of *Sinensia* which was issued in its entirety in December, 1939. Thus, *Aorichthys* must be considered a junior synonym of *Sperata*.

Holly (1939) specifically indicated that *Sperata* was proposed as a replacement for *Macrones* Duméril, 1856, which was shown to be preoccupied. According to article 67(h) of the Code, a replacement name for the junior homonym must take the same type as the name it replaces "despite any statement to the contrary." Therefore, *Sperata* must take *Bagrus lamarrii* Valenciennes as its type even though Holly, for whatever reason, listed *Sperata vittata* (Bloch) as the type of his new name.

Four species of *Sperata* are recognized herein. The species were found to differ in a variety of meristic characters, summarized in Tables 1 through 6. In addition, the shape of several bones of the head and nape also appear to diagnose the species. The small sample size of some species available for study, combined with the wide range of sizes of specimens, made it difficult to find morphometric trends among the species. A few morphometric distinctions are proposed (Table 7), but a thorough study of the morphometry of the species was not possible on the basis of the available material.

Because we now recognize three *Sperata* species in the Ganges River basin, within which only two species have been recognized previously, it is difficult to ascertain at this time which aspects of the biology of these fishes, if any, are species specific. Therefore, a summary of the biology of *Sperata* is presented here, rather than in the individual species accounts.

All species of *Sperata* are important food fishes (Prashad and Mukerji 1929; Talwar and Jhingran 1991) that grow to a large size, cited as reaching 1.8 m in various literature sources (e. g., Talwar and Jhingran 1991), but reports of specimens greater than 1 m are rare. Some preliminary information of the size at maturity is found in Sundara Raj (1962:194), within which the species were in the genus *Mystus*. Therein, nest-guarding males identified as *Mystus aor* ranged in size from 342 to 460 mm, while a single *M. seenghala* male was 685 mm. Saigal (1967:24) found that gonad maturation commenced at about a total length of 800 mm in specimens identified as *Mystus aor*.

Food habits were reported for *Sperata aor* (Saigal 1967). Young individuals were found to eat primarily insects off the substratum, whereas adults fed on fish and insects from both the water column and on the bottom. A wide variety of fish were found in the gut contents of *S. aor*, and the relative proportion of various types of food changed seasonally.

The reproductive biology of *Sperata* is incompletely known. Spawning is said to occur before the beginning of the southwest monsoon season (Saigal 1967; Talwar and Jhingran 1991), and nests were found in rocky-bottoms at Bhavani, India, during the month of May (Sundara Raj 1962:194). Individuals were reported to spawn at irregular intervals throughout the reproductive season and females were capable of producing more than 1.2 million ova (Saigal 1967:25). The most remarkable aspect of the reproductive biology of *Sperata* was the suggestion made by Sundara Raj (1962:195) that males may incubate eggs in highly vascularized, spongy skin on the ventral surface of their abdomen, and that the same males may feed the newly hatched fry with a milky-white exudate from the abdominal wall. Saigal (1967:29) reported that mature individuals had "almost empty guts" during the breeding season, suggesting that they did not feed during that period. As mature *Sperata* are primarily piscivorous, the cessation of feeding activity by the parents while caring for the young be

TABLE 1. Precaudal and caudal vertebral counts for four species of *Sperata*.

	Precaudal vertebrae								Caudal vertebrae									
	16	17	18	19	20	21	22	23	28	29	30	31	32	33	34	35	36	37
<i>S. acicularis</i>		4	2											1	2	1		2
<i>S. aor</i>	4	4	9	1								2	4	5	5	2		
<i>S. aorella</i>	5											3	1	1				
<i>S. seenghala</i>						6	2	3	2	2	1	3	1					

TABLE 2. Preanal and total vertebral counts for four species of *Sperata*.

	Preanal vertebrae								Total vertebrae								
	25	26	27	28	29	30	31	32	47	48	49	50	51	52	53	54	
<i>S. acicularis</i>						5	1							2	2		2
<i>S. aor</i>				3	10	4						1	6	9	2		
<i>S. aorella</i>	1	2	2						3	1	1						
<i>S. seenghala</i>					4	4	1	1					3	1	5	1	

TABLE 3. Pectoral and branched anal-fin ray counts for four species of *Sperata*.

	Pectoral-fin rays				Branched anal-fin rays				
	8	9	10	11	8	9	10	11	12
<i>S. acicularis</i>		1	14				12	2	1
<i>S. aor</i>			21	5	2	15	9		
<i>S. aorella</i>		9	1			10			
<i>S. seenghala</i>	2	15			2	12	3		

TABLE 4. Gill rakers on lower and upper arm of first gill arch of four species of *Sperata*.

	Lower gill rakers						Upper gill rakers					
	11	12	13	14	15	16	17	2	3	4	5	6
<i>S. acicularis</i>	7	5	1	2					13	2	1	
<i>S. aor</i>		3		10	12	1			1	6	18	1
<i>S. aorella</i>					5	4	1				4	6
<i>S. seenghala</i>	15	2						2	13	2		

a mechanism to avoid cannibalism. Although a wide range of parental behavior has been documented for catfish (Blumer 1982; Ferraris 1991), parental feeding of fry is rare. Only one other species, *Bagrus meridionalis* Günther, has been reported to feed its young. McKay (1986) observed young *B. meridionalis* feeding on unfertilized eggs expelled by the guarding adult female, and hypothesized that this food source was supplemented by invertebrates brought to the nest by the male. Further investigation of this report by LoVullo and Stauffer (1992) confirmed these observations. Although the mode of parental feeding in *B. meridionalis* differs from that reported for *Sperata*, it is noteworthy that these two genera were recently hypothesized to be sister groups (Mo 1991).

KEY TO THE SPECIES OF *SPERATA*

1. Interneural shield (exposed portion of supraneural) as long as, or longer than, supraoccipital spine; in large individuals, interneural shield rugose and ovoid (Figs. 2b, 2d) 2
- Interneural shield markedly shorter than supraoccipital spine and not rugose (Figs. 2a, 2c) 3
2. Interneural shield approximately as long as supraoccipital spine (Fig. 2b); pectoral-fin rays 10 or 11; snout rounded in dorsal view; maxillary barbel typically extends to caudal fin; orbit extends across the middle of length of head; gill rakers typically 19 or 20 *Sperata aor* (India, Bangladesh, Nepal)
- Interneural shield longer than supraoccipital spine (Fig. 2d); pectoral-fin rays 8 or 9; snout distinctly truncate in dorsal view; maxillary barbel typically extends no further than to middle of body, at least in large individuals; orbit entirely in anterior half of head; gill rakers 13–15 *Sperata seenghala* (India, Bangladesh, Nepal, Pakistan)
3. Supraoccipital spine long, slender and needlelike, tapering to a point posteriorly (Fig. 2a); pectoral-fin rays 10 (rarely 9); branched anal-fin rays 10–12; gill rakers usually 14 or 15 (rarely 16–19) *Sperata acicularis* n. sp. (Myanmar, ?Thailand)
- Supraoccipital spine long, distinctly narrower anteriorly and with rounded posterior end (Fig. 2c); pectoral-fin rays 9 (rarely 10); branched anal-fin rays 9; gill rakers 20 to 22 *Sperata aorella* (eastern India, Bangladesh)

***Sperata acicularis* new species**

Figs. 2a, 3, 4a

Macrones aor (not Hamilton): Day 1873:cclxi (in part) (Burma); 1877:444 (Burma); 1889:149 (Burma). Vinciguerra 1890:217 (Burma: Mandalay). Kyaw Win 1971:53, fig. 22-1 (Burma: Irrawaddy River at Taung-tha-man 'inn').

Aoria aor (not Hamilton): Prashad and Mukerji 1929:178 (Burma: Indawgyi Lake).

Mystus (Aorichthys) aor (not Hamilton): Misra 1976:74 (in part) (upper Burma).

Aorichthys aor (not Hamilton): Jayaram, 1981:205 (in part, Burma). Talwar and Jhingran 1991:547 (in part) (upper Burma).

?*Macrones seenghala* (not Sykes): Chaudhuri, 1911:20 ("Lake Tali Fu, Yunnan").

TYPE MATERIAL. — HOLOTYPE: CAS 209024, 277 mm, Myanmar, Yangon Division, South Oak-ka-lar-pa Market (eastern Yangon), 27–28 Oct. 1997, C. J. Ferraris, Mya Than Tun. PARATYPES: BMNH 1894.5.24.23–24 (2, 274–295 mm), Myanmar, Sittaung River, E. W. Oates. CAS 209023 (2, 70–199 mm), Tenasserim River, upstream from Htee-tah, 1–16 March 1992, T. R. Roberts. CAS 67697 (1, 417 mm), Thailand, Chao Phraya Basin, Sing Buri Market. CAS(SU) 14491 (2, 258–283 mm), Myanmar, Pegu [= Bago], 1940, A. W. Herre. NRM 14980 (2, 150.0–165.0 mm), Myanmar, Mandalay, 1935. NRM 31056 (1, 214 mm), Myanmar, Kachin State, Ayeyarwaddy River, 10 March 1934, R. Malaise. NRM 31080 (2, 157–189 mm), Myanmar, Sagaing Division, Shweli River, probably emptying into Ayeyarwaddy at Inywa, Feb 1935, Maung Lu Daw. NRM 40002 (1, 196 mm), Myanmar, Kachin State, Myitkyina market, 30 March 1997, F. Fang, and A. Roos. NRM 40650 (3, 191–234 mm), Myanmar, Myitkyina, Lonton village market on Lake Indawgyi, 31 March 1998, S. O. Kullander, and R. Britz.

DIAGNOSIS. — *Sperata acicularis* is readily distinguished from its congeners by having both a long, slender supraoccipital spine that tapers posteriorly to a point and a slender interneural shield that is shorter than the supraoccipital spine and no wider than the widest part of that spine.

This species can be further distinguished from each of the other species of *Sperata* by one or more additional characters. *Sperata acicularis* differs from *S. aorella* in having fewer gill rakers (14–19, typically 14 or 15, vs. 20–22), more precaudal vertebrae (17 or 18, vs. 16), more preanal vertebrae (29 or 30, vs. 25–27), more total vertebrae (51–54 vs. 47–49), more ribs (15–17, vs. 13 or 14), more branched anal-fin rays (10 or more, vs. 9) and more pectoral-fin rays (10, rarely 9, vs. 9, rarely 10). *Sperata acicularis* differs from *S. aor* in having modally fewer gill rakers (14 or 15, vs. 19 or 20) and generally more anal-fin rays (10–12, vs. 8–10) than *S. aor*, and a truncate, rather than broadly rounded, snout. *Sperata acicularis* differs from *S. seenghala* in having fewer precaudal vertebrae (17 or 18, vs. 21–23), more caudal vertebrae (33–27, vs. 28–32) more pectoral-fin rays (10,

TABLE 5. Total gill rakers on first gill arch of four species of *Sperata*.

	Gill rakers									
	13	14	15	16	17	18	19	20	21	22
<i>S. acicularis</i>		6	6	1		1	1			
<i>S. aor</i>			1	1	1	2	11	8	2	
<i>S. aorella</i>								1	6	3
<i>S. seenghala</i>	1	13	3							

TABLE 6. Number of rib-bearing vertebrae in four species of *Sperata*.

	Ribs							
	13	14	15	16	17	18	19	20
<i>S. acicularis</i>			1		2			
<i>S. aor</i>		10	7	3	1			
<i>S. aorella</i>	4	1						
<i>S. seenghala</i>				1	4	4		1

rarely 9, vs. 8 or 9), modally more branched anal-fin rays (10, vs. 9), and by the placement of the orbit in the middle of the head, rather than entirely in the anterior half.

DESCRIPTION. — Body long, slender; deepest at dorsal-fin origin, tapering gradually both anteriorly and posteriorly. Ventral surface of head and body flat to anal-fin base. Body slightly compressed and triangular in cross section across abdomen, compressed and ovoid across caudal region. Caudal peduncle narrow, only slightly deeper than diameter of eye. Anus and urogenital openings located at vertical through middle of adpressed pelvic fin; remote from anal-fin base. Skin smooth. Lateral line complete, midlateral; canal curves slightly dorsally on caudal-fin base. In humeral region, lateral line with numerous accessory canals and pores.

Head elongate, progressively depressed anteriorly. In lateral view, profile of head acutely triangular, with ventral surface of head nearly horizontal. Gill opening wide, extending from exposed surface of posttemporal to beyond isthmus. Gill membranes free from, and not attached across, isthmus. Branchiostegal rays 12. Bony elements of dorsal surface of head covered with thin skin; bones readily visible, ornamented with fine, irregular, radial grooves. Midline of cranium with elongated fossa extending from posterior of snout nearly to base of supraoccipital spine. Within fossa, broad epiphysal bar separates slender anterior and posterior medial fontanels. Lateral fontanel small, shorter than orbital diameter. Supraoccipital spine elongate, slender, pointed at tip. Cephalic lateral-line canal system with extensive branching of most canals; integument covering fontanels, cheeks, and olfactory chamber thoroughly covered with canals and pores.

Barbels in four pairs. Maxillary barbel long, slender, without medial membrane; barbel extends at least to middle of adipose fin, and reaches caudal peduncle in some specimens. Nasal barbel slender, short; extending no further than anterior margin of orbit. Inner mental barbel remote from midline and slightly thicker and longer than nasal barbel; extending past middle of eye. Outer mental barbel originating about one eye diameter posterolateral of inner mental barbel; barbel thicker and longer than inner mental barbel, extending to level of pectoral-fin origin.

Eye ovoid, horizontal axis longest; located entirely in dorsal half of head. Posterior margin of orbit at middle of head length. Upper margin of orbit nearly reaching dorsal profile of head. Eye diameter more than one-third of snout length and slightly less than interorbital width. Orbital margin free.

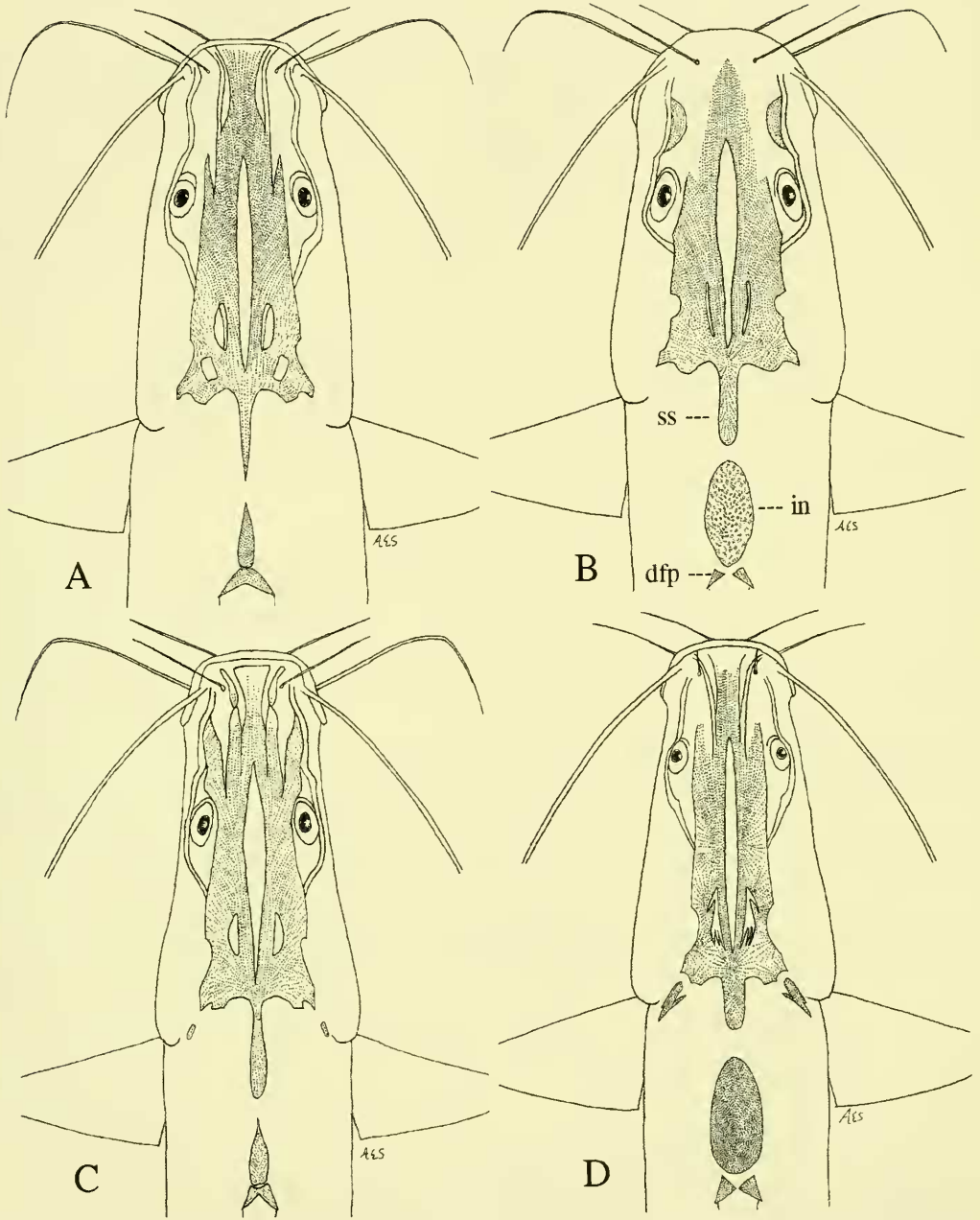


FIGURE 2. Head and nape of four species of *Sperata*, in dorsal view. Maxillary barbels truncated; stippled areas indicate bones that are exposed at surface. a) *Sperata acicularis* new species, CAS 209024, 277 mm; b) *Sperata aor*, CAS(SU) 14124, 278 mm; c) *Sperata aorella*, CAS(SU) 34852, 234 mm; d) *Sperata seenghala*, CAS 24247, 284 mm. Abbreviations: ss – supraoccipital spine; in – interneural shield; dfp – exposed portion of first dorsal-fin pterygiophore. Illustration by Alison Schroeder.

TABLE 7. Selected measurements for four species of *Sperata*. Measurements are mean value, reported as percentage of standard length or head length, followed by range of values in parenthesis.

	<i>S. acicularis</i> (n = 15)	<i>S. aor</i> (n = 24)	<i>S. aorella</i> (n = 9)	<i>S. seenghala</i> (n = 15)
% Standard length				
Anal-fin base length	10.4 (9.2-11.5)	10.6 (9.3-11.5)	9.7 (8.1-11.6)	10.0 (9.2-11.3)
Head length	32.5 (30.7-33.7)	29.5 (26.7-34.6)	34.0 (33.3-35.2)	30.0 (27.8-33.1)
Interneural shield length	13.0 (10.0-17.2)	23.1 (18.8-29.0)	14.5 (12.7-15.6)	28.6 (23.5-33.0)
Preadipose length	65.5 (47.4-43.6)	61.8 (58.3-64.6)	70.2 (68.4-72.1)	70.6 (68.8-73.8)
Preal length	75.1 (71.4-78.6)	73.4 (69.8-77.5)	77.0 (75.0-79.1)	76.7 (72.8-79.4)
Predorsal length	45.2 (43.7-47.4)	41.8 (38.3-45.7)	47.7 (46.4-49.2)	43.5 (41.6-45.5)
% Head length				
Body width at cleithrum	46.9 (44.0-54.7)	55.7 (47.7-62.5)	49.9 (47.6-52.6)	50.3 (44.0-53.8)
Interneural shield length	13.0 (10.0-15.9)	23.1 (18.8-29.0)	14.5 (12.7-15.6)	28.6 (23.5-33.0)
Interorbital width	19.0 (17.5-22.4)	23.2 (20.5-28.1)	22.0 (20.6-23.2)	21.9 (18.3-24.0)
Occipital spine length	20.9 (18.2-26.5)	21.0 (17.1-25.6)	27.4 (25.3-29.4)	16.2 (14.3-17.8)
Orbit length	14.2 (10.5-16.0)	16.7 (13.6-22.9)	12.6 (9.5-13.6)	12.8 (10.1-17.9)
Pectoral spine length	41.8 (36.0-48.6)	46.7 (43.6-56.2)	51.0 (46.6-50.9)	46.8 (40.5-54.5)
Pelvic fin length	49.3 (46.8-52.9)	56.1 (50.0-60.7)	52.6 (49.4-55.8)	48.7 (42.9-52.3)
Snout length	36.3 (34.3-37.7)	38.3 (31.8-43.2)	38.5 (36.1-41.8)	28.1 (26.5-30.3)
Snout to supraoccipital spine length	108.4 (113.7-120.0)	111.6 (102.4-119.8)	116.0 (113.7-120.0)	107.2 (103.4-110.8)

Snout long and depressed; lateral margins nearly parallel. Anterior margin of snout slightly rounded, nearly truncate in some individuals. Mouth slightly subterminal; most premaxillary teeth exposed when mouth closed. Oral teeth small, sharply pointed, in irregular rows on all tooth-bearing surfaces. Premaxillary tooth band shallowly crescentic, width of band somewhat greater near midline. Tooth band of dentary narrower than premaxillary band at symphysis, tapering laterally. Palatal tooth patch unpaired, continuous across midline; smoothly arched along anterior margin, tapering laterally to point that extends posteriorly well past level of premaxillary band; band width narrower than premaxillary band at midline, widening laterally and then tapering to sharp point posterolaterally. Gill rakers of first arch long, slender, and closely spaced. Gill rakers 11 to 14 on lower arm plus 3 (rarely 4 or 5) on upper arm. Rakers present only on outer face of first two arches, on both faces of next two arches.

Dorsal fin located above middle of body; fifth or sixth dorsal-fin ray located at vertical through middle of standard length. Dorsal-fin base shorter than length of first branched ray. Dorsal fin margin straight, first branched ray longest, more than twice length of last ray. Last ray without posterior membranous connection to body. Dorsal fin with spinelet, spine, and 7 branched rays. Dorsal-fin spine long, straight and slender; spine margin smooth anteriorly and laterally, but with fine serrations on distal half of posterior edge. Spine slightly shorter than first branched ray. Tip of adpressed spine just reaches adipose-fin origin. Distance between dorsal fin and adipose fin less than dorsal-fin base length. Interneural shield narrow, tapering to fine point anteriorly; shorter than supraoccipital spine. Superficial ossification of dorsal-fin pterygiophores broadly united across midline, and forming a chevron-shaped bone, pointed anteriorly (Fig. 4a).

Adipose-fin base approximately $1\frac{1}{2}$ times length of dorsal-fin base; fin height about one-fourth of its length. Adipose-fin margin straight anteriorly, slightly convex for remainder of its length; posterior portion deeply incised.

Caudal fin deeply forked; lobes pointed, asymmetrical, lower lobe wider than upper; upper lobe continued as filament in intact specimens. Middle rays approximately one-third as long as unbranched principal ray of lower lobe. Principal caudal fin with rays: i,7,8,i. Procurrent rays symmetrical and extending only slightly anterior to fin base.

Anal-fin origin ventral to middle of adipose fin. Anal-fin margin straight; first branched ray longest, about twice length of last ray, which lacks posterior membranous connection to body. Anal fin with 3 or 4 unbranched, and 10 (rarely 11 or 12) branched rays.

Pelvic-fin origin at vertical through posterior end of dorsal-fin base. Fin margin straight, its first branched ray longest; posterior-most ray about two-thirds length of first ray. Fin with one unbranched and five branched rays. Tip of adpressed fin not reaching to anal-fin origin.

Pectoral fin with stout spine, sharply pointed at tip. Anterior spine margin smooth, posterior margin with moderately strong serrations along entire length. Pectoral-fin margin straight anteriorly, convex posteriorly. First branched ray longer than spine and approximately $2\frac{1}{2}$ times as long as last ray. Pectoral-fin with 10 (rarely 9) branched rays.

COLOR IN PRESERVATIVE. — Body silvery grey on dorsal half of lateral surface, white or silver ventrally. Grey region resulting from presence of fine black pigment covering side of body for most of its length, but only dorsal to lateral line on caudal peduncle. Dorsal surface of body and head brown. On head, brown regions restricted to exposed cranial bones and around orbit. Ventral surface of head and abdomen without dark pigmentation.

Dorsal fin pale basally, progressively darker distally; anterior edge of spine and distal extent of rays dusky. Dusky region of anterior rays less extensive than on more posterior rays. Adipose fin mostly dusky; margin of fin with fine, distinct dark band. Posterior portion of fin with ovoid black spot, smaller than orbit in diameter; spot surrounded by pale halo. Caudal peduncle with blackened area just ventral to adipose-fin spot, appearing as extension of spot. Caudal fin dusky, ventral lobe darker; ventral unbranched principal ray and ventral procurrent rays white. Anal fin generally pale

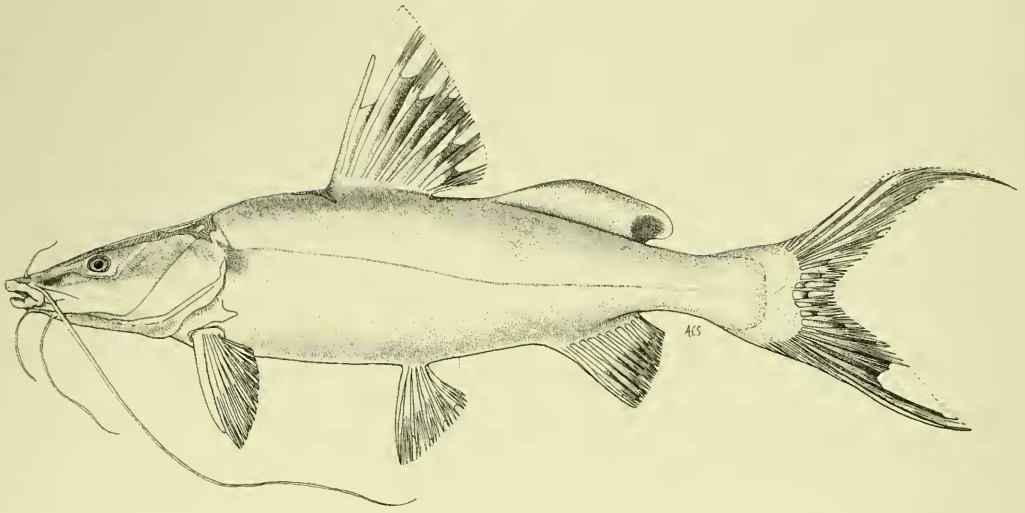


FIGURE 3. *Sperata acicularis*, new species, 277 mm SL, holotype, CAS 209024, Myanmar, Yangon Division, South Oak-ka-lar-pa market. Illustration by Alison Schroeder.

with only slight duskiness distally; in one specimen (CAS 209024) distal half of anal fin heavily pigmented. Pelvic fin pale, or with broad diffuse dusky subterminal band. Pectoral fin with scattered fine dark pigmentation on outer rays, little or no pigment on innermost rays. Pectoral spine dark dorsally and pale ventrally.

REMARKS. — The first record of *Sperata acicularis* appears to be that of Day (1873), where Myanmar (as Burma) is listed among the localities for *Macrones aor* and the Burmese name for this species, *Nga-joung*, is noted. This species has been generally considered conspecific with *Sperata aor*, but at least one author has suggested a difference between that species and the Ayeyarwaddy River form (recognized here as *S. acicularis*). Kyaw Win (1973) noted that the maxillary barbel of specimens from near Mandalay extend only to the adipose fin and not to the end of the caudal fin as widely reported for individuals of *S. aor* from the Ganges River drainage. Although the maxillary barbel of *S. aor* does not always extend to the tip of the caudal fin (see Remarks under that species), it extends well past the adipose-fin origin.

Little has been reported about the biology of *Sperata acicularis*. Prashad and Mukerji (1929) stated that the species was abundant both in Indawgyi Lake and elsewhere in northern Myanmar and was a common food fish all year round.

DISTRIBUTION. — *Sperata acicularis* is known from the Ayeyarwaddy, Bago, and Tenasserim river systems of Myanmar. One record from the Chao Phraya basin of Thailand (CAS 67697) is probably incorrect since there are no literature accounts of the species or any of its congeners in the Chao Phraya, or anywhere else in Thailand (e. g., Smith 1945; Suvatti 1950; Kottelat 1989). As this species is quite large and distinctive, we believe it unlikely that it was overlooked until now and, instead, suggest that the locality information associated with this specimen is erroneous.

Sperata acicularis appears to be the only species present in Myanmar, but during this study we examined one specimen of *S. seenghala* (NRM 18809), which was reported from "probably Mandalay or Yangon areas." Whether this represents a second species in Myanmar or an erroneous locality cannot be determined at this time.

ETYMOLOGY. — The name *acicularis*, Latin for needlelike (Brown 1956), refers to the long slender supraoccipital spine that most readily distinguishes this species from its congeners.

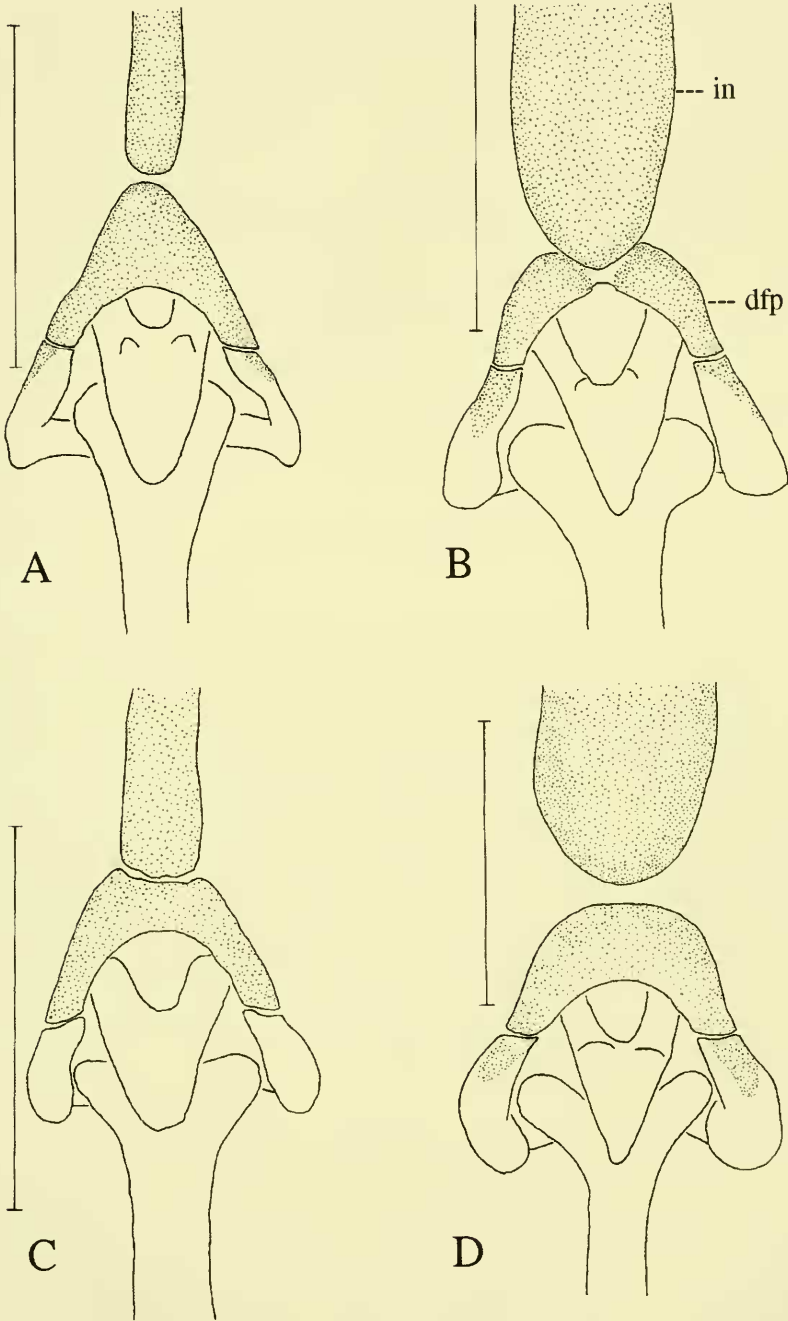


FIGURE 4. Anterior view of dorsal fin and associated ossifications of four species of *Sperata*, in dorsal view. Stippled area indicate bony parts of interneural shield and dorsal-fin pterygiophores that are visible in intact specimens. a) *Sperata acicularis* new species, NRM 31056, 214 mm; b) *Sperata aor*, CAS(SU) 34853, 215 mm; c) *Sperata aovella*, MCZ 39637, 179 mm; d) *Sperata seenghala*, MCZ 8185, 259 mm. Abbreviations: in – interneural shield; dfp – exposed portion of first dorsal-fin pterygiophore. Scale bar = 10 mm. Illustration by Kathryn Runge.

***Sperata aor* (Hamilton, 1822)**

Figs. 1, 2b, 4b

Pimelodus aor Hamilton, 1822:205, 379, pl. 20, fig. 68 (Type locality: Rivers of Bengal and upper parts of Gangetic estuaries).

Bagrus aor Valenciennes, in Cuvier and Valenciennes, 1840a:405 (Bengale). Valenciennes, 1840 (in Jacquemont, 1835–1844): pl. 16 (India).

Bagrus aorides Jerdon, 1849:336 (Type locality: India: Cauvery River at Errode; no types known to exist).

Macrones aor Günther, 1864:78 (India, Bangladesh). Day 1873:cclxi (in part) (plains of India); 1877:444 (in part) (India). Lydekker, 1886:250, pl. 36, fig. 5 (India: Siwalik Hills [Tertiary deposits]). Day 1889:149 (in part) (India); Woodward, 1901:327 (India: Siwalik Hills [Lower Pliocene]).

Mystus (Osteobagrus) aor Jayaram, 1954:548, fig. 10 (in part) (India); Srivastava, 1968:77, fig. 49 (India: Uttar Pradesh).

Aorichthys aor Jayaram, 1973:155, fig. 1a, (in part, India); 1981:205, fig. 98, 99b (in part) (India, Bangladesh). Talwar and Jhingran 1991:547, fig. 178 (in part) (India, Nepal, Bangladesh).

Mystus (Aorichthys) aor Misra, 1976:74 (in part) (India).

Mystus aor Aaur Rahman, 1989:197 (Bangladesh); Shrestha, 1994:54, fig. 83 (Nepal: Terai region).

DIAGNOSIS. — *Sperata aor* is distinguished from its congeners by the combination of a broadly rounded snout margin and a large, ovoid, interneural shield that is approximately the same length as the supraoccipital spine.

In addition, this species has a unique combination of meristic values that further distinguish it from each of its congeners. *Sperata aor* has a higher modal gill-raker count than does *S. acicularis* (19 or 20, vs. 14 or 15) and generally fewer branched anal-fin rays (8–10, vs. 10–12). *Sperata aor* differs from *S. aorella* in having more preanal vertebrae (28–30, vs. 25–27), more total vertebrae (50–52, rarely 49, vs. 47–49), and more pectoral-fin rays (10 or 11, vs. 9, rarely 10). *Sperata aor* has a higher modal gill-raker count than does *S. seenghala* (19, vs. 14) as well as more pectoral-fin rays (10 or 11, vs. 8 or 9) and fewer precaudal vertebrae (16–19, vs. 21–23).

DESCRIPTION. — Body long, slender; body depth at dorsal-fin origin only slightly greater than that anterior to adipose-fin origin, more posteriorly tapering gradually. Ventral surface of head and body flat to anal-fin base. Body slightly compressed and triangular in cross section across abdomen, compressed and ovoid across caudal region. Caudal peduncle narrow, only slightly deeper than diameter of eye. Anus and urogenital openings located at vertical through middle of adpressed pelvic fin; distance from anal-fin base greater than anal-fin base length. Skin smooth. Lateral line complete, midlateral; canal curves slightly dorsally on caudal-fin base. Lateral line in humeral region with numerous accessory canals and pores.

Head elongate, progressively depressed anteriorly. In lateral view, profile of head acutely triangular, with ventral surface of head nearly horizontal. Gill opening wide, extending from exposed surface of posttemporal to beyond isthmus. Gill membranes free from, and not attached across, isthmus. Branchiostegal rays 12 or 13. Bony elements of dorsal surface of head covered with thin skin; bones readily visible, ornamented with fine, irregular, radial grooves. Midline of cranium with elongate fossa extending from posterior of snout nearly to base of supraoccipital spine; posterior half of fossa occupied by posterior fontanel, separated from slender anterior fontanel by wide epiphyseal bar. Lateral fontanel small, shorter than orbital diameter. Supraoccipital spine elongate, with parallel sides and blunt posterior tip. Spine of smaller specimens slender and needlelike, becoming proportionally wider in larger individuals. Cephalic lateral-line canal system with extensive branching of most canals; integument covering fontanels, cheeks, and olfactory chamber thoroughly covered with canals and pores.

Barbels in four pairs. Maxillary barbel long, slender, without medial membrane; tip of barbel extends at least to caudal peduncle and often past tip of caudal-fin rays. Nasal barbel slender; extending

past anterior margin of orbit and sometimes to its posterior margin. Inner mental-barbel origin close to midline; barbel thicker and longer than nasal barbel, extending to level of posterior margin of orbit. Outer mental barbel originates about one-half of eye diameter posterolateral of inner mental barbel; barbel thicker and longer than inner mental barbel, extending past pectoral-fin origin.

Eye ovoid, horizontal axis longest; located entirely in dorsal half of head. Center of eye at middle of head length. Upper margin of orbit reaching dorsal profile of head; frontals bowed dorsally along lateral margin; interorbital region of neurocranium distinctly concave. Eye diameter less than, or equal to, one-half of snout length and slightly less than interorbital width. Orbit with free margin.

Snout long and depressed; lateral margins slightly convergent anteriorly. Snout margin distinctly rounded, with fleshy upper lip extending anteriorly beyond upper jaw. Mouth subterminal, premaxillary tooth patch exposed when mouth closed. Oral teeth small, sharply pointed, in irregular rows on all tooth-bearing surfaces. Premaxillary tooth band rounded, of equal width throughout. Dentary tooth band much narrower than premaxillary band at symphysis, tapering laterally. Palatal tooth patch unpaired, continuous across midline; smoothly arched along anterior margin, tapering laterally to point extending posteriorly well past level of premaxillary band; band width narrower than premaxillary band at midline, widening laterally and then tapering to sharp point posterolaterally. Gill rakers of first arch long, slender and closely spaced. Gill rakers 12 to 15 on lower arm plus 4 or 5 (rarely 3 or 6) on upper arm. Rakers present only on outer face of first two arches, present on both faces of next two arches.

Dorsal fin located above middle of body; middle of fin at vertical through middle of standard length. Dorsal-fin base shorter than length of first branched ray. Dorsal-fin margin straight, first branched ray longest, more than twice length of last ray. Last dorsal-fin ray without posterior membranous connection to body. Dorsal fin with spinelet, spine, and 7 branched rays. Dorsal-fin spine long, straight, and comparatively robust; slightly shorter than first branched ray. Anterior and lateral spine margins of small specimens smooth, with fine serrations on distal half of posterior edge. In large individuals, anterior and lateral margin of spine granular, posterior serrations less prominent. Tip of adpressed spine reaches past adipose-fin origin. Distance between dorsal fin and adipose fin less than one-half of dorsal-fin base length. Interneural shield elongate oval with rounded anterior and posterior margins. Superficially first dorsal-fin pterygiophore appears narrowly united across midline or completely separated by thick skin; anterior margin deeply concave anteriorly (Fig. 4b).

Adipose-fin base length approximately $1\frac{1}{2}$ to 2 times that of dorsal-fin base; fin height about one-fifth of its length. Adipose-fin margin slightly convex for entire length; posterior end deeply incised.

Caudal fin deeply forked; lobes pointed, symmetrical, except upper lobe continued as filament in intact specimens. Middle rays approximately one-third as long as unbranched principal ray of lower lobe. Principal caudal fin with rays: i,7,8,i. Procurent rays symmetrical and extend only slightly anterior to fin base.

Anal-fin base ventral to posterior half of adipose fin. Fin margin straight; first branched anal-fin ray longest and about twice length of last ray. Last ray without posterior membranous connection to body. Anal fin with 3 or 4 unbranched, and 8 to 10 branched rays.

Pelvic-fin origin at vertical through posterior end of dorsal-fin base. Pelvic-fin margin slightly convex; first branched ray longest, posterior-most ray about two-thirds length of first ray. Pelvic fin with one unbranched and five branched rays. Tip of adpressed fin not reaching to anal-fin origin.

Pectoral fin with stout spine, sharply pointed at tip. Anterior spine margin smooth, posterior margin with moderately strong serrations along entire length. Pectoral-fin margin straight anteriorly, convex posteriorly. First branched ray longer than spine and approximately $2\frac{1}{2}$ times as long as last ray. Pectoral fin with 10 or 11 branched rays.

COLOR IN PRESERVATIVE. — Body silvery grey to brown dorsally and on upper half of lateral surface, white or pale ventrally. Grey region resulting from fine black pigment that extends ventrally

to lateral line along caudal peduncle and somewhat below lateral line more anteriorly. Dorsal surface of head brown, most prominent on exposed cranial bones and laterally to level of ventral margin of orbit. Ventral surface of head and abdomen pale. Humeral region with diffuse, eye-sized, dark spot at upper extent of gill opening.

Dorsal fin dusky at base and on distal half of fin, with medial oblique pale band. Adipose fin dusky, leading edge sometimes darker, but not forming distinct terminal band. Posterior end of fin with ovoid black spot approximately equal in size to pupil. Adipose fin without pigmentation dorsal and posterior to spot. Dorsal surface of caudal peduncle with tiny blackened area posterior to adipose fin, appearing as extension of spot. Caudal fin with scattered pigmentation, primarily on branched rays of ventral lobe and base of dorsal lobe; ventral unbranched principal ray and ventral procurrent rays white. Anal fin pale, with little or no pigmentation. Pelvic fin with few fine, scattered pigmentation, somewhat denser basally. Pectoral fin with irregularly scattered pigmentation on dorsal surface, pale ventrally.

REMARKS. — *Sperata aor* has typically been distinguished from the one previously recognized congener, *S. seenghala*, on the basis of three characters: a longer maxillary barbel, a rounded (vs. truncate) snout, and fewer principal caudal-fin rays (17, vs. 19–21) (e.g., Jayaram 1981; Talwar and Jhingran 1991). We found that the first two characters are generally accurate, although difficult to interpret in some specimens. The maxillary barbel of *Sperata aor* always extends at least to the caudal peduncle and often past the caudal-fin base while that of *S. seenghala* usually does not extend past the posterior end of the dorsal-fin base. However, the smallest specimens of *S. seenghala* we examined (SU 41083, 108–130 mm) had maxillary barbels that extended past the middle of the adipose fin, nearly as far as those of some *S. aor*. It appears that barbel length distinguishes adults of these two species, but not for juveniles.

The snout of a well-preserved specimen of *Sperata aor* is indeed broadly rounded and contrasts markedly with the nearly straight snout margin of *S. seenghala*. However, specimens of *S. aor* sometimes have a truncate, if somewhat asymmetrical, snout margin that is not easily distinguished from *S. seenghala*. It appears to us that these specimens were first preserved with their snouts pushed against the bottom or side of their container, making the snout shape an artifact of preservation. Thus, snout shape may readily distinguish fresh specimens, but may lead to misidentifications of some preserved material.

The reported difference in caudal-fin ray counts between *Sperata seenghala* and *S. aor* appeared first in Day (1876), and has been widely repeated up to recent times (e.g., Jayaram 1981; Talwar and Jhingran 1991). We found no species-level distinction in caudal-fin ray counts. Nearly all *Sperata* specimens examined had 17 principal rays, with a few specimens having 16.

Sperata aor is the only species of the genus known from fossil material. A single specimen found in Tertiary deposits in the Siwalik Hills (Lydekker 1886; Woodward 1901) exhibits the same shape and size of the interneural shield as that of Recent material.

DISTRIBUTION. — Known from the Ganges river system of India, Bangladesh, and Nepal and in peninsular India south to the Cauvery River.

Jayaram, Venkateswarlu and Ragunathan (1982) reported this species from the Cauvery River of southern India, but Talwar and Jhingran (1991) listed only *Sperata seenghala* from that drainage. We have not examined any specimens from that drainage during the course of this study and, therefore, we cannot resolve this discrepancy. However, the original description of *Bagrus aorides* Jerdon, from the Cauvery River at Errode, sheds some light on the question. The description of *B. aorides* states that the maxillary barbel extends to the caudal fin, and the adipose fin originates just posterior to the end of the dorsal-fin base. Both of these characteristics agree more closely with those of *Sperata aor* than to *S. seenghala*. In addition, the eye was said to be “so situated that its posterior edge is more than half the length of the head from the muzzle” (Jerdon 1849:336), which means that the eye is not located entirely in the anterior half of the head as it is in *S. seenghala*. Thus, the description more

closely resembles that of *S. aor*. On that basis, we agree with Day (1877) who first placed *Bagrus aorides* in the synonymy of *S. aor* and, thereby, provisionally include the Cauvery River in the distribution of *S. aor*.

MATERIAL EXAMINED. — 26 specimens, 57–278 mm. **BANGLADESH:** AMNH 56289 SD, 2, (dry skeleton, not measured). CAS 209022 (3, 60–63 mm), Shala Bazar, 36 km from Sylhet Town, near Kuchiara River. UMMZ 208359 (2, 134–153 mm), Comilla, Meghna River, upstream from Chandpur, just downstream from Gumti, River mouth at Kanudi, 23°19'N, 90°39'E. UMMZ 208445 (1, 179 mm), Barisal, Meghna River at Gazipur Char, 22°47'N, 90°43'E. **INDIA:** AMS B 7945 (1, 265 mm), Calcutta. ANSP 83981 (2, 57–109 mm), Pulta water works, on the Hughly River, about 17 miles from Calcutta, Barrackpore District. ANSP 85764 (1, 124 mm), Bombay. CAS 61857 (3, 145–160 mm), Fish Market at Sonapur. CAS 62096 (8, 126–208 mm), Karnataka State, Bellary District, Tungabhadra River and Reservoir at Hospet, Hampi, and Kampli, Krishna River basin. CAS(SU) 14124 (1, 278 mm), Pulta, Ganges Delta. CAS(SU) 34853 (1, 215 mm), Pulta. MCZ 62947 (1, 63.5 mm), Khadak Vasle Dam. NRM 13414 (1, 161 mm), Delhi, fish market.

Sperata aorella (Blyth, 1858)

Figs. 2c, 4c, 5

Bagrus aorellus Blyth, 1858:283 (Type locality: India: Calcutta fish market; no types known to exist).

DIAGNOSIS. — *Sperata aorella* is distinguished from its congeners by having a long, slender, supraoccipital spine that is markedly longer than the interneural shield. The supraoccipital spine is uniquely shaped in being constricted basally (Fig. 2c). This species is also unique in the genus in having fewer than 28 preanal vertebrae and fewer than 50 total vertebrae. It is the only species of *Sperata* that has both a truncate snout and barbels that extend past the adipose fin.

In addition, this species can be further distinguished from each of its congeners by at least one additional character. It differs from *Sperata acicularis* in having fewer branched anal-fin rays (9, vs. 10–12), modally fewer pectoral-fin rays (9, rarely 10, vs. 10, rarely 9), fewer ribs (13 or 14, vs. 15–17), and more gill rakers (20–22, vs. 14–19, typically 14 or 15). *Sperata aorella* has fewer pectoral-fin rays than *S. aor* (9, rarely 10, vs. 10 or 11), fewer preanal vertebrae (25–27, vs. 28–30), modally more gill rakers (21, vs. 19), a truncate, rather than rounded, snout, and an interneural shield that is not wider than the supraoccipital spine. *Sperata aorella* can be distinguished from *S. seenghala* in having fewer precaudal vertebrae (16, vs. 21–23), fewer preanal vertebrae (25–27 vs. 29–32), fewer ribs (13 or 14 vs. 16–20), more gill rakers (20–22, vs. 13–15), the posterior margin of the orbit situated at about the middle of the head length instead of distinctly anterior of the midline, and an interneural shield that is not wider than the supraoccipital spine.

DESCRIPTION. — Body long, slender; deepest at dorsal-fin origin, tapering gradually both anteriorly and posteriorly. Ventral surface of head and body flat to anal-fin base. Body slightly compressed and triangular in cross section across abdomen, compressed and ovoid through caudal region. Caudal peduncle only slightly deeper than wide. Anus and urogenital openings located at vertical through middle of adpressed pelvic fin; remote from anal-fin base. Skin smooth. Lateral line complete, midlateral; canal curves slightly dorsally on caudal-fin base; in humeral region, canal with numerous accessory canals and pores.

Head elongate, progressively depressed anteriorly. In lateral view, ventral surface of head nearly horizontal. Gill opening wide, extending from exposed surface of posttemporal to anterior of isthmus. Gill membranes free from, and not attached across, isthmus. Branchiostegal rays 12. Bony elements of dorsal surface of head covered with only thin skin; bones readily visible, ornamented with fine, irregular, radial grooves. Midline of cranium with elongate fossa, extending from posterior of snout nearly to origin of supraoccipital spine; fossa occupied by slender, elongate anterior and posterior

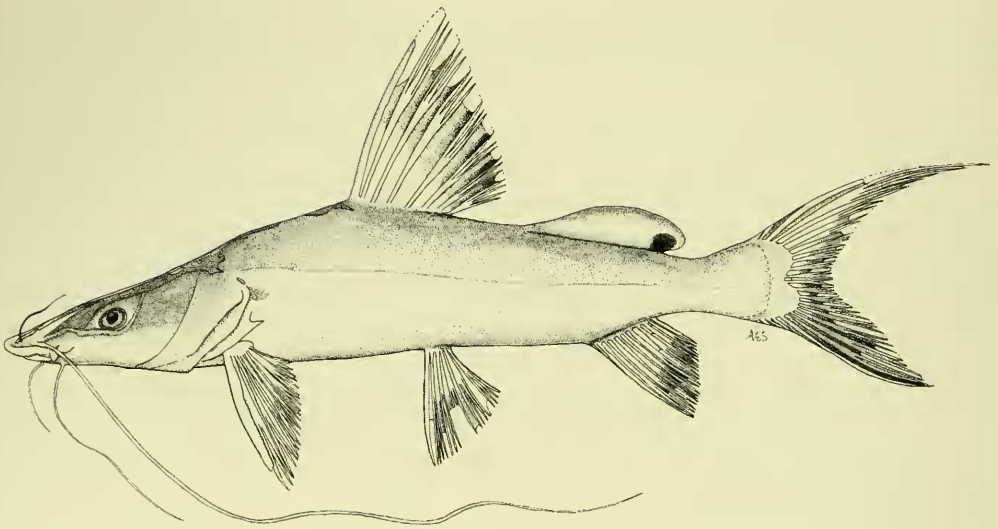


FIGURE 5. *Sperata aorella*, CAS(SU) 34852, 234 mm, Calcutta. Illustration by Alison Schroeer.

fontanels, separated by wide epiphyseal bar. Lateral fontanel shorter than diameter of orbit. Supraoccipital spine elongate, lateral margins nearly parallel past basal constriction, tip rounded; surface ornamented like that of other exposed bony elements of head. Cephalic lateral-line canal system with extensive branching of most canals; integument covering fontanels, cheeks, and olfactory chamber thoroughly covered with canals and pores.

Barbels in four pairs. Maxillary barbel long, slender, without medial membrane; barbel extends at least to middle of caudal peduncle, and may reach caudal-fin margin. Nasal barbel slender, short; extending at least to anterior margin of orbit, but not past middle of eye. Inner mental-barbel base closer to outer mental barbel than to midline and slightly thicker and longer than nasal barbel; barbel extending to past vertical through middle of eye. Outer mental barbel thicker and longer than inner mental barbel, extending past pectoral-fin origin, its base about one eye diameter posterolateral of inner mental barbel.

Eye ovoid, horizontal axis longer; located entirely in dorsal half of head. Upper margin of orbit nearly reaching dorsal profile of head. Eye diameter about one-third of snout length and one-half interorbital width. Orbit with free margin.

Snout long and depressed; lateral margins nearly parallel; anterior margin truncate, slightly rounded in some individuals. Mouth subterminal, premaxillary teeth all exposed even when mouth is closed. Oral teeth small, sharply pointed, irregularly arranged on tooth-bearing surfaces. Premaxillary tooth band shallowly arched, width of band approximately equal throughout its length. Dentary tooth band as broad as premaxillary band at symphysis, but tapering laterally. Palatal tooth patch continuous across midline, but notched medially; anterior margin smoothly arched, tapering laterally to point that extends posteriorly well beyond level of premaxillary band; band width near midline broader than premaxillary band. Gill rakers of first arch long, slender and closely spaced; reduced to rudiments anteriorly on lower arm. Gill rakers 15 to 17 on lower arm plus 5 or 6 on upper arm. Rakers present only on outer face of first two arches; on both faces of next two arches.

Dorsal fin centered above middle of standard length. Dorsal-fin base shorter than length of first dorsal-fin branched ray. Dorsal-fin margin straight, first branched ray longest, more than twice length of last ray. Last dorsal-fin ray without posterior membranous connection to body. Dorsal fin with spinelet, spine, and 7 branched rays. Dorsal-fin spine long, straight, slender; spine margin smooth

anteriorly and laterally; with fine serrations on distal half of posterior edge. Spine slightly shorter than first branched ray. Tip of adpressed spine just reaches adipose-fin origin. Distance between bases of dorsal adipose fins less than dorsal-fin base length. Interneural shield small, narrow; much shorter than supraoccipital spine (Fig. 2c). Superficial ossification of dorsal-fin pterygiophores broadly united across midline, and forming a crescent shaped bone (Fig. 4c).

Adipose-fin base length about equal to that of dorsal fin; adipose-fin height about one-third its length. Adipose-fin margin slightly convex for most of its length, posterior end deeply incised.

Caudal fin deeply forked; lobes pointed and asymmetrical, upper lobe continued as filament when intact. Middle rays approximately one-third as long as unbranched principal ray of lower lobe. Principal caudal fin with rays: i,7,8,i. Procurent rays symmetrical and extend only slightly anterior to fin base.

Anal fin located ventral to posterior half of adipose fin. Fin margin slightly convex; first branched ray longest, about twice length of last ray. Last ray without posterior membranous connection to body. Anal fin with 3 or 4 unbranched, and 9 branched rays.

Pelvic-fin origin at vertical through posterior end of dorsal-fin base. Pelvic-fin margin straight, first branched ray longest; posterior-most ray about two-thirds length of first ray. Pelvic fin with one unbranched and five branched rays. Tip of adpressed fin not reaching to anal-fin origin.

Pectoral fin with stout spine, sharply pointed at tip. Anterior spine margin smooth, posterior margin with fine serrations along entire length. Pectoral-fin margin straight anteriorly, convex posteriorly. First branched ray longer than spine and approximately $2\frac{1}{2}$ times as long as last ray. Fin with 9 (rarely 10) branched rays.

COLOR IN PRESERVATIVE. — Body silvery grey to brown dorsally and on upper half of lateral surface, white ventrally. Demarcation between grey and white regions distinct, occurring ventral to lateral line along most of body length, but along lateral line on caudal peduncle. Dorsal surface of head brown; brown regions restricted to exposed cranial bones and around orbit. Posterior margin of orbital flap white. Ventral surface of head and abdomen pale, without dark pigmentation.

Dorsal fin mostly pale; leading edge of spine and distal portion of rays dusky. Dusky region of anterior rays broader than on more posterior rays, but less than distal one-quarter of rays darkened. Adipose fin mostly dusky; fin margin with fine, distinct, dark terminal band. Posterior portion of fin with ovoid black spot, smaller in diameter than orbit. Caudal peduncle with darkened area just ventral to adipose-fin spot. Caudal fin generally dusky; white on ventral unbranched principal ray and ventral procurent rays. Anal fin pale basally, becoming increasingly dark distally; leading edge of fin pale. Pelvic fin pale, with broad, diffuse dusky subterminal band. Pectoral fin pale basally, becoming increasingly dark distally; little or no pigment on innermost rays. Dorsal surface of spine dark, pale ventrally.

REMARKS. — *Sperata aorella* has been overlooked as a valid species since shortly after it was first described. The name was placed in the synonymy of *Macrones aor* by Günther (1864), without comment. Shortly thereafter, Day (1877) placed the name in the synonymy of *Macrones seenghala*, also without explanation or comment on Günther's action. More recently, the name *Bagrus aorellus* has either been placed in synonymy of *Sperata seenghala* (e.g., Misra 1976), or ignored (e.g., Jayaram 1954; Jayaram 1973).

The general appearance of this species is somewhat intermediate between the two commonly recognized Indian species, *Sperata aor* and *S. seenghala*. The maxillary barbel extends nearly to the caudal fin, as in *S. aor*. However, the snout margin is clearly truncate, which is characteristic of *S. seenghala*. We therefore assume that researchers who encountered this species had difficulty in choosing which name to assign it.

Use of the name *Sperata aorella* for this species is of necessity somewhat tentative, inasmuch as we have not been able to locate the types of this species. Most of the types of species described in Blyth (1858) are not accounted for (e.g., Eschmeyer 1998) and the primary repository for Blyth

specimens, the Zoological Survey of India, Calcutta, is not known to have specimens that may be types of Blyth's *Bagrus aorellus* (Menon and Yazdani 1968). Nevertheless, Blyth's description, although brief, fits the species that we are hereby associating with his name. *Sperata aorella* was said to be somewhat thicker than *S. aor* and, most notably, to have a "more developed" occipital process and "small bony plate, not exceeding the occipital process in breadth." We interpret the former statement to refer to the length of the supraoccipital spine, which is noticeably longer in *S. aorella* than in either of its Gangetic congeners. The small bony plate, which we are calling the interneural shield, is quite massive in the other Gangetic species, but is shorter, and no wider, than the supraoccipital spine in *S. aorella*. Blyth also noted differences in the form of the exposed portion of the first dorsal-fin pterygiophore, which is broadly united across the midline in *S. aorella* (Fig. 4c), but divided medially on the surface by thick skin in *S. aor* (Fig. 4b).

Because of the scarcity of recent literature referring to *S. aorella*, it is impossible to determine how much of the literature on *Sperata seenghala* or *S. aor* refers instead to this species, which is reasonably abundant in the Ganges River delta.

DISTRIBUTION.—Known from the Ganges River delta of Bangladesh and India, extending inland at least as far as Birsampur.

MATERIAL EXAMINED.—10 specimens, 152–277 mm. **BANGLADESH:** UMMZ 187866 (2, 244–245 mm), Comilla, Pond at Hajiganj (ca. 18 mi N Chandpur). UMMZ 208590-S (1, skeleton, not measured), Chandpur. **INDIA:** MCZ 39637 (1, 179 mm), Ganges, Calcutta. MCZ 8190 (1, 164 mm), Calcutta. CAS(SU) 14510 (1, 277 mm), Birsampur, Central Province [= Bihar]. CAS(SU) 34852 (4, 153–234 mm), Calcutta.

Sperata seenghala (Sykes, 1839)

Figs. 2d, 4d, 6, 7, 8

Platystoma seenghala Sykes, 1839a:164 (Type locality: India: Deccan; no types known to exist); 1839b:61; 1841:371, pl. 65, fig. 2.

Bagrus lamarii Valenciennes, in Cuvier and Valenciennes, 1840a:407, pl. 415 [labelled *lamarii*] (Type locality: India: Ganges River; holotype: MNHN A.9343).

Bagrus aorinus Valenciennes, 1840 (in Jacquemont, 1835–1844):pl. 17, figs. 1, 1a (Type locality: India; no types known to exist).

Macrones lamarii Günther, 1864:79 (India, ?Afghanistan).

Macrones lamarii Day 1873:cclxi (Ganges and Jumna rivers).

Macrones seenghala Day, 1877:444 (India); 1889:149 (in part) (India).

Mystus seenghala Aatur Rahman, 1989:198, fig. 120 (Bangladesh); Shrestha, 1994:54, fig. 84 (Nepal: Terai region).

Mystus (Osteobagrus) seenghala Jayaram, 1954:555 (in part) (India, Pakistan, ?Yunnan). Srivastava, 1968:79, fig. 50 (India: Uttar Pradesh).

Aorichthys seenghala Jayaram, 1973:155, figs. 1b, 3b (India, Pakistan, ?Yunnan). Mirza, 1980:24 (Pakistan: Punjab, Sind, Baluchistan; Azad Kashmir). Jayaram, 1981:205, fig. 98, 99b (India, Pakistan, Bangladesh). Talwar and Jhingran 1991:548, unnumbered plate (India, Bangladesh, ?Afghanistan, Nepal, Pakistan).

Mystus (Aorichthys) seenghala Misra, 1976:79, fig. 16 (India).

Aorichthys aor (not Hamilton) Mirza, 1980:24 (in part) (Pakistan: Punjab, Sind).

Aorichthys aor sarwari Mirza, Nawaz, and Javed, 1992:211 (Type locality: Pakistan: Ravi River at Head Balloki, Kasur District; holotype: GCM F-19 [not seen]).

DIAGNOSIS.—*Sperata seenghala* differs from its congeners in that the eye is situated completely in the anterior half of the head (Fig. 2d). It has more precaudal vertebrae (21–23) than any of its congeners, and it is the only *Sperata* species in which the length of the supraoccipital spine is less than that of the interneural shield. In addition, the adipose fin is relatively shorter than that of its congeners, with its base approximately equal to, or only slightly longer than, the dorsal-fin base.

Additional characters help distinguish this species from each of its congeners. *Sperata seenghala* differs from *S. acicularis* in having fewer caudal vertebrae (28–32, vs. 33–37), fewer pectoral-fin rays (8 or 9, vs. 10, rarely 9) and modally fewer branched anal-fin rays (9, vs. 10). *Sperata seenghala* has fewer pectoral-fin rays than does *S. aor* (8 or 9, vs. 10 or 11), and modally fewer gill rakers (14, vs. 19). *Sperata seenghala* differs from *S. aorella* in having more preanal vertebrae (29–32, vs. 25–27), more total vertebrae (50–53, vs. 47–49), and fewer gill rakers (13–15, vs. 20–22).

DESCRIPTION. — Body long, slender; body depth at dorsal-fin origin only slightly greater than that anterior to adipose-fin origin, gradually tapering posteriorly. Ventral surface of head and body flat to anal-fin base. Body slightly compressed and triangular in cross section across abdomen, compressed and ovoid through caudal region. Caudal peduncle moderately narrow, depth approximately twice diameter of eye. Anus and urogenital openings located at vertical through middle of adpressed pelvic fin; distance from these openings to anal-fin base greater than anal-fin base length. Skin smooth. Lateral line midlateral and complete, curving slightly dorsally on caudal-fin base. In humeral region, lateral line with numerous accessory canals and pores.

Head elongate, progressively depressed anteriorly. Head length one-third of standard length. Profile of head acutely triangular in lateral view, with ventral surface of head nearly horizontal. Gill opening wide, extending from exposed surface of posttemporal to beyond isthmus. Gill membranes free from, and not attached across, isthmus. Branchiostegal rays 12 or 13. Bony elements of dorsal surface of head covered with only thin skin; bones readily visible and ornamented with fine, irregular, radial grooves. Midline of cranium with elongate fossa, extending from posterior of snout nearly to base of supraoccipital spine; fossa occupied by anterior and posterior fontanels, separated by wide epiphyseal bar. Lateral fontanel length less than orbital diameter. Supraoccipital spine relatively short, parallel sided with blunt posterior tip. Spine of smaller specimens acutely pointed, with wide base. Cephalic lateral-line canal system with extensive branching of most canals; integument covering fossa, cheeks, and olfactory chamber thoroughly covered with canals and pores.

Barbels in four pairs. Maxillary barbel long, slender, without medial membrane; barbel extends at least to dorsal-fin origin and may reach past dorsal-fin base in adults; in small individuals (e.g., CAS(SU) 41083, 108–130 mm), barbels reach to adipose-fin base. Nasal barbel slender, short; not reaching anterior margin of orbit. Inner mental barbels originate close to midline, separated by diameter of pupil; barbels thicker and much longer than nasal barbel; extending to, and usually past, posterior margin of orbit. Outer mental barbel originates about one eye diameter posterolateral of inner mental barbel; barbel thicker and slightly longer than inner mental barbel, not reaching pectoral-fin origin.

Eye ovoid, horizontal axis longest; located entirely in dorsal half of head and anterior to middle of head length. Upper margin of orbit nearly reaching dorsal profile of head. Eye diameter one-half snout length and slightly less than interorbital width in small individuals. In larger specimens, eye diameter about one-third of snout length and only about one-half interorbital width. Orbital margin free.

Snout long and depressed, lateral margins parallel. Anterior snout margin distinctly truncate. Mouth subterminal, anterior margin of premaxillary tooth patch exposed when mouth closed. Oral teeth small, sharply pointed, in irregular rows on all tooth-bearing surfaces. Premaxillary tooth band nearly straight along anterior margin. Tooth band of dentary as broad as premaxillary band at midline, gently curved and tapering laterally. Palatal tooth patch continuous across midline; anterior margin nearly straight, with straight, obliquely directed lateral margin. Tooth patch broader than premaxillary band at midline, widening laterally and then tapering to sharp point posterolaterally. Gill rakers of first arch long, slender, and closely spaced. Gill rakers 11 (rarely 12) on lower arm plus 3 (rarely 2 or 4) on upper arm. Rakers present only on outer face of first two arches, on both faces of next two arches.



FIGURE 6. *Sperata seenghala*, illustration from Sykes (1841, pl. 65, fig. 2), presumed holotype.

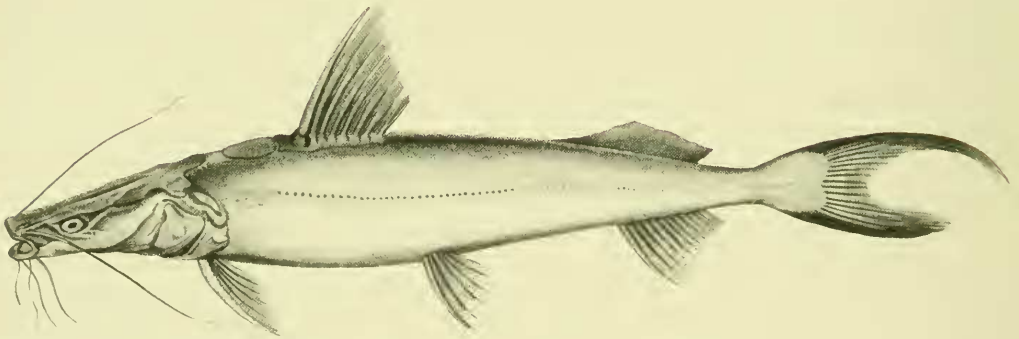


FIGURE 7. *Sperata seenghala*, illustration from Cuvier and Valenciennes (1840, pl. 415), holotype of *Bagrus lamarrii* Valenciennes, 1840.

Dorsal fin centered above middle of standard length. Dorsal-fin base shorter than length of first branched ray. Dorsal-fin margin straight; first branched ray longest, more than twice length of last ray. Last dorsal-fin ray without posterior membranous connection to body. Dorsal fin with spinelet, spine, and 7 branched rays. Dorsal-fin spine long, straight, slender; spine margin smooth anteriorly and laterally, with fine serrations on distal half of posterior edge. Spine slightly shorter than first branched ray; adpressed spine tip falls far short of adipose-fin origin. Distance between dorsal- and adipose-fin bases approximately equals dorsal-fin base length. Interneural shield ovoid, longer than wide; posterior end wider and more bluntly rounded than anterior end (Fig. 2d). Superficial ossification of dorsal-fin pterygiophores broadly united across midline; anterior margin broadly rounded (Fig. 4d) or incised anteriorly.

Adipose-fin base equal to, or slightly longer than, that of dorsal fin; fin height about one-third of its length. Adipose-fin margin straight anteriorly, then slightly convex following abrupt angular transition; posterior end deeply incised.

Caudal fin deeply forked, lobes pointed and symmetrical, except for filamentous extension of upper lobe. Middle rays approximately one-third as long as unbranched principal ray of lower lobe.

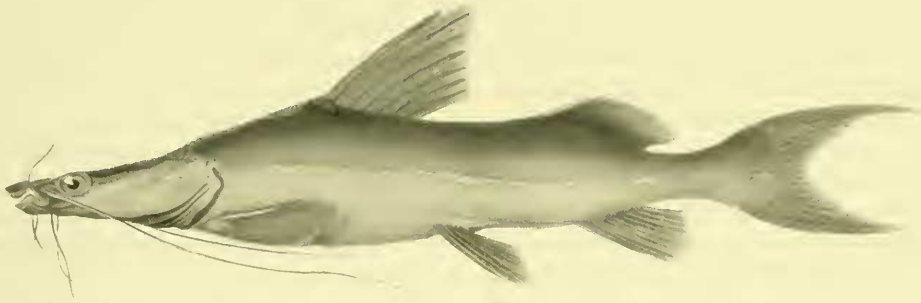


FIGURE 8. *Sperata seenghala*, illustration from Jacquemont (1835–1844, pl. 17, fig. 1) holotype of *Bagrus aorinus* Valenciennes, 1840.

Principal caudal fin with rays: i,7,8,i. Procurrent rays symmetrical and extend only slightly anterior to fin base.

Anal-fin origin ventral to posterior half of adipose fin. Anal-fin margin straight; first branched ray longest, about twice length of last ray. Last anal-fin ray without posterior membranous connection to body. Anal-fin with 3 or 4 unbranched, and 8 to 10 branched rays.

Pelvic fin-origin at vertical through posterior end of dorsal-fin base. Pelvic-fin margin slightly convex, second branched ray longest; posterior-most ray about two-thirds length of first ray. Pelvic fin with one unbranched and five branched rays. Tip of adpressed pelvic fin not reaching to anal-fin origin.

Pectoral fin with stout spine, sharply pointed at tip. Anterior spine margin smooth, posterior margin with moderately strong serrations along entire length. Pectoral fin margin straight anteriorly, convex posteriorly. First branched pectoral-fin ray longer than spine and approximately $2\frac{1}{2}$ times as long as last ray. Pectoral fin with 9, rarely 8, branched rays.

COLOR IN PRESERVATIVE. — Body silvery grey to brown on upper half of lateral surface, white or pale ventrally. Grey or brown pigmentation resulting from fine black pigment that extends to lateral line on caudal peduncle and somewhat more ventrally for most of body. Dorsal surface of head brown; head pigmentation most prominent on exposed cranial bones, but also extending to level of ventral margin of orbit and on entire opercle. Ventral surface of head and abdomen pale. Humeral region with diffuse, eye-sized, dark spot at upper extent of gill opening.

Dorsal fin dusky for distal half, pale basally. Adipose fin dusky; leading edge and margin with distinct terminal band. In large individuals, adipose fin coloration similar to that of dorsal part of body; smaller individuals distinctly paler. Posterior portion of fin with ovoid black spot; spot somewhat smaller than eye diameter. Spot surrounded by pale halo, especially along dorsal and posterior margin. Caudal peduncle with blackened area just ventral to adipose-fin spot, appearing as extension of spot. Caudal fin with scattered pigmentation, denser on outer branched rays of ventral lobe and base of dorsal lobe; ventral unbranched principal ray and ventral procurrent rays white. Anal fin pale, with little or no pigmentation. Pelvic fin with fine, scattered pigment, somewhat denser basally. Pectoral fin with scattered pigment dorsally; pale ventrally.

REMARKS. — *Platyostoma seenghala* Sykes (1839a) was described from the Mota Mota River in the upper reaches of the Krishna River basin. Apparently, Sykes had a single specimen in hand, as he reported a specimen size ($8\frac{1}{2}$ inches) while remarking that the species grows to a much larger size. This presumed holotype is apparently lost, as it has not been reported on in subsequent publications, and the whereabouts of it, along with virtually all other Sykes types, is unknown (see Eschmeyer 1998). The published illustration of the presumed holotype in a more thorough account of the species

(Sykes 1841, pl. 65, fig. 2; reproduced here as Fig. 6) shows a fish that quite closely resembles the species which is generally associated with the name. The snout is distinctly truncated and the eye is located in the anterior half of the head. As noted previously by Jayaram (1954), Sykes mentioned and illustrated a puzzling condition of the pelvic fin. He reported that the "fish is remarkable for having the first ray of the ventral fins, as well as that of the pectoral, serrated posteriorly" (Sykes 1841:372). This condition was not found in the pelvic fin of any specimens examined by Jayaram or us. In addition, no catfish known to us has a spine or serrated ray in its pelvic fin, which makes it unlikely that Sykes was referring to another species.

The specimens we examined from the Krishna River basin are about the same length as, or shorter than, the one reported on by Sykes, and therefore exhibit characteristics of the presumed juvenile form. The supraoccipital spine is slender and the interneural shield is not as broad as in larger specimens. The maxillary barbel extends past the base of the adipose fin and, therefore, well beyond the dorsal fin, as is characteristic of larger specimens. We have not been able to examine larger specimens from the Krishna, and therefore must infer that the comparatively larger interneural shield and shorter barbel that characterizes larger specimens from other drainages also occurs in specimens from the Krishna.

We place several nominal species in the synonymy of *Sperata seenghala*, despite the paucity of relevant type material. *Bagrus lamarrii* Valenciennes is clearly this species and has been widely regarded as such (e.g., Day 1877; Jayaram 1954). The holotype, a dried mounted specimen, exhibits all of the externally visible diagnostic characters that we report for *Sperata seenghala*. These characters are also clearly seen in the published illustration of the specimen (reproduced here as Fig. 7).

The name *Bagrus aorinus* Valenciennes (in Jacquemont 1840) is based solely on an illustration (reproduced as Fig. 8), for which there is no associated text, and no type specimens have been reported (e.g., Bertin and Esteve 1950; Daget 1984). For this study we examined and failed to uncover a *Sperata* specimen in the Museum national d'Histoire naturelle in Paris that matched the figured specimen. However, the figure is clearly that of a specimen of *Sperata seenghala*, as shown by the anteriorly placed orbit, the large interneural shield, the short maxillary barbel, and the short adipose-fin base. Contrary to current practice, we date the name *Bagrus aorinus* to 1840 following the study by Daget (1984). Therein, Daget noted that Valenciennes cited the Jacquemont plates in volume 15 of *Histoire Naturelle des Poissons* (Cuvier and Valenciennes 1840b), but not in volume 14 (Cuvier and Valenciennes 1840a), even though illustrations of several fishes described in volume 14 were among those included in the Jacquemont plates. Bailey (1951) determined the date of publication of volume 15 (Cuvier and Valenciennes 1840b) to be November, 1840, and that of volume 14 to be January 1840. This suggests that the Jacquemont plates were published some time before November, 1840, but after volume 14 was submitted for publication (presumed to be sometime in 1839). However, for purposes of priority, unless evidence of an earlier publication date for the Jacquemont plates comes to light, it must be assumed that they were published sometime in 1840 but before November of that year. Thus, the 1841 publication date for the plates, which was first reported in Bertin and Esteve (1950) and used in Eschmeyer (1998) is incorrect, but the name *Bagrus aorinus* Valenciennes (in Jacquemont, 1840) must be considered to have been published after *Pimelodus seenghala* Sykes, 1839, and *Bagrus lamarrii* Valenciennes, 1840.

Mirza (1990), and Mizra, Nawaz, and Javed (1992) demonstrated that only one species of *Sperata* occurs in the Indus River drainage. Although we examined far fewer specimens than in those studies, we independently reached this same conclusion. Based on the shape of the snout and the number of caudal-fin rays, Mirza Nawaz, and Javed (1992) concluded that the Indus River specimens were similar to *Sperata aor*, but differed sufficiently in the length of the maxillary barbel that they were assigned to a new subspecies, *Aorichthys aor sarwari*. In our study, we found snout shape variation sometimes difficult to interpret, as the snout of many specimens were deformed by preservation, and

that caudal-fin ray counts did not vary among the species. Thus, the decision to compare the Indus River specimens only to *Sperata aor* was not appropriate. Instead, the Indus River specimens we examined did not differ from specimens of *Sperata seenghala* from throughout the Indian region. However, as mentioned above, our study was done on a relatively small sample size. If a more thorough comparison of the various populations of *Sperata seenghala* indicated that the Indus River specimens represented a distinct species, the name *Sperata sarwari* would be its valid name.

DISTRIBUTION. — *Sperata seenghala* is widely distributed in the Ganges and Indus river systems, and also occurs in several major rivers in peninsular India at least as far south as the Krishna River (Jayaram 1981; Talwar and Jhingran 1991). Jayaram, Venkateswarlu and Raganathan (1982) indicated that one specimen of this species was taken from the Cauvery River, and they implied that the species may have been introduced recently into rivers south of the Krishna River. Perhaps based on the report of Jayaram et al. (1982), Talwar and Jhingran (1991) listed the Cauvery River in the distribution of this species, without further comment.

Several accounts of the presence of *Sperata seenghala* in Yunnan, China, appear to be based on a single report by Chaudhuri (1911). Therein, the species was said to have been collected from Lake Tali Fu [= Er Hai], a high elevation lake that drains into the Mekong River system of western Yunnan. The species was neither described nor illustrated, leaving some doubt about its identity. Furthermore, no additional reports of *S. seenghala*, or any of its congeners, have been made for any locality within Yunnan and the species was not included in the comprehensive inventory of Yunnan fishes (Chu and Chen 1989). Therefore we conclude that the report in Chaudhuri (1911) is probably incorrect. Either the specimen collected was not a *Sperata*, or the locality information associated with the specimen was incorrect. A large portion of the collection reported on by Chaudhuri (1911) was from Bhamo, Myanmar; it is possible that the specimen was taken there, rather than in Er Hai. If so, Chaudhuri (1911) may have actually collected a specimen of *Sperata acicularis*.

One specimen from the Swedish Museum of Natural History (NRM 18809) is clearly a *Sperata seenghala*, but it is reported to come from “probably Mandalay or Yangon areas.” If the locality information is correct, it represents a range extension for *S. seenghala*, as well as the possibility of a second species of *Sperata* in the Ayeyarwaddy River system.

MATERIAL EXAMINED. — 18 specimens, 108–720 mm. **BANGLADESH:** AMNH 56290 SD (2, dry skeletons, not measured). UMMZ 208295 (1, 301 mm), Comilla, Meghna River downstream from Gumti River mouth, 23°19'N, 90°38'E. **INDIA:** CAS 62079 (1, 173 mm), Karnataka State, Tungabhadra (Bellary?) District, Tungabhadra River and Reservoir at Hospet and Kambi (Krishna River basin). MCZ 8185 (1, 259 mm), Sutlej River near Loodina [= ?Ludhiana]. CAS(SU) 41083 (2, 108–130 mm), Poona District. CAS(SU) 41084 (1, 190 mm), Lower Anicut River, Madras Pres. **INDIA/PAKISTAN:** MCZ 22203, (1, 257 mm), Bengal, “North India” (possibly including Pakistan), sub-Himalayan region. MCZ 22208 (1, 396 mm), Bengal, “North India” (possibly including Pakistan), sub-Himalayan region. MNHN A.9343 (1 (holotype of *Bagrus lamarrii*), 720 mm), Ganges. **PAKISTAN:** CAS 24247 (1, 284 mm), Indus River, 5 mi N of Sukkur. MCZ 22185 (5, 228–442 mm), Punjab, Chenab River. **MYANMAR:** NRM 18809 (1, 221 mm), “probably Mandalay or Yangon areas.”

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